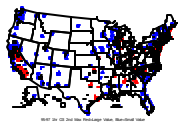
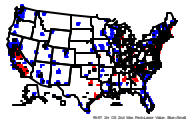


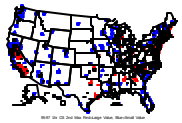
# Monitoring Strategy:



# *'National' Analysis*

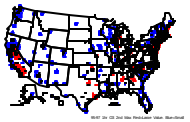
- Why was it done?
- What is it? (Methodology, Outputs)
- What does it show? (General Interpretations)
- Caveats / Criticisms
- Follow-up activities

Mark Schmidt
MQAG/EMAD/OAQPS
x2416



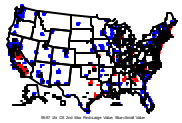
Monitoring Strategy:

# *'National' Analysis*



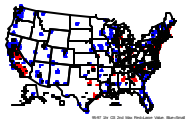
## Why do a National analysis?

- Show evidence of over-monitoring
  - Confirm belief that many sites are: low percent of NAAQS, redundant, too close to each other...
- Set stage for revised monitoring strategy
  - Flat funding / Changing priorities ~ Invest in new monitoring efforts (e.g., air toxics), divest in some criteria pollutant monitoring
- Spur Regional / Local analysis
  - National analysis are broad-bush and simplistic.  Actual changes will result from more in-depth local analyses.
- Highlight general areas (geographic) of overkill



Monitoring Strategy:

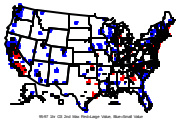
*'National' Analysis*



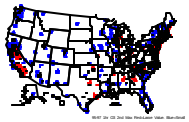
# What is the National analysis?

- Evaluation of all criteria pollutant networks ($O_3$, $PM_{10}$, $PM_{2.5}$, $SO_2$, Pb, CO, $NO_2$), all metrics (e.g., $PM_{10}$ annual mean and 24-hr)
  - Three central pieces:
    1. Evaluation of each sites' 'percent of NAAQS'
    2. Multi-objective 'information value' approach ~ Shows relative value of each site according to different monitoring objectives ~ Ranked each site (by pollutant / metric) according to 5 measures [Concentration, Uncertainty, Deviation from NAAQS, Area represented by Site, & Population represented by site]. The measure rankings were then aggregated based on different weighting schemes and composite maps produced.
    3. Trends evaluation: Looked at 5-year and 10-year trends ('91-'00 & '96-'00)

Used 3-year avg. ('design value') of annual metric: used years 1998-2000 for all (and also 1995-1997 for O3)



Monitoring Strategy:



# *'National' Analysis*

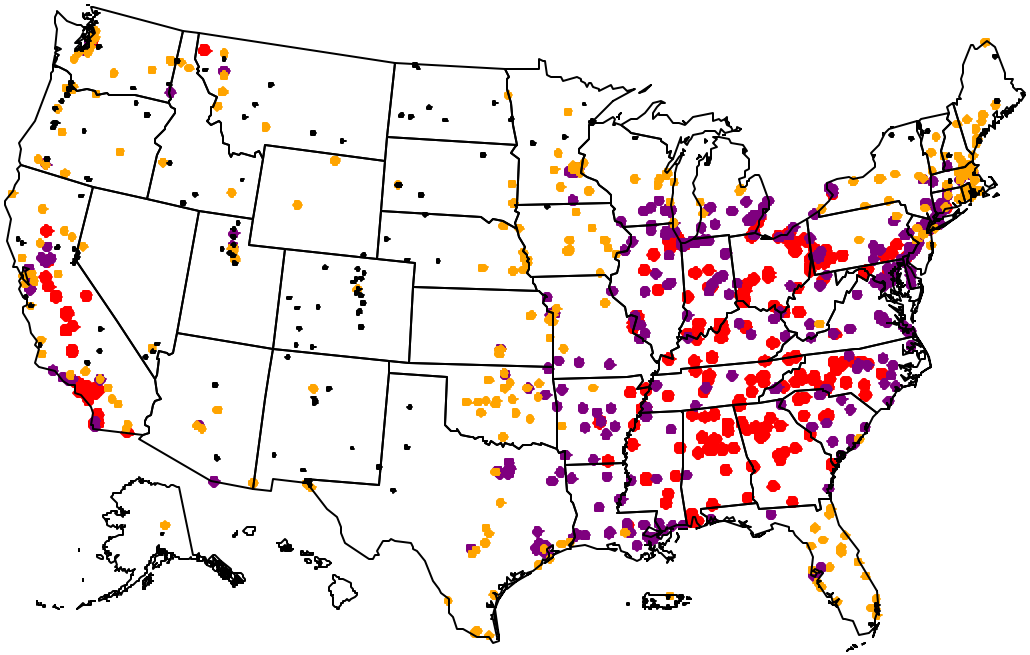
# What is the National analysis? - Cont.

1. Evaluation of each sites' 'percent of NAAQS'

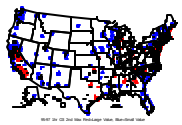
PM25 Annual Mean - Percent of NAAQS:

Red= >100%, Purple= 80-100%,

Orange= 60-80%, Black= <60%

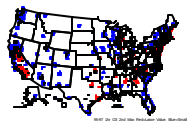


PM25 Annual Mean Percent of NAAQS:Red= >100%. Purple= 80-100%. Orange= 60-80%. Black= <60%



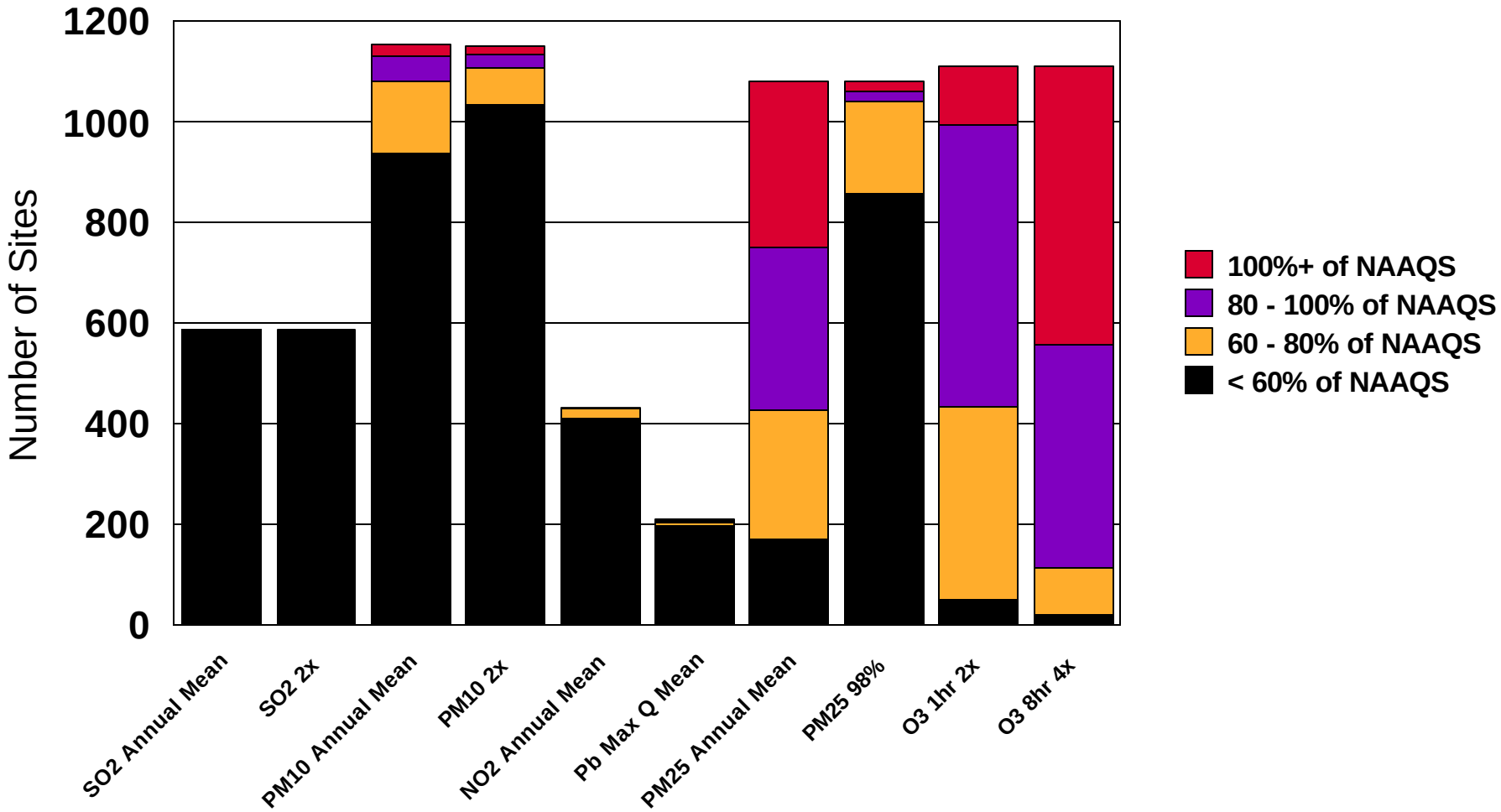
Monitoring Strategy:

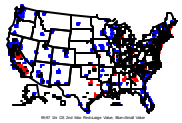
*'National' Analysis*



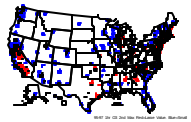
# What is the National analysis? - Cont.

1. Evaluation of each sites' 'percent of NAAQS'





Monitoring Strategy:

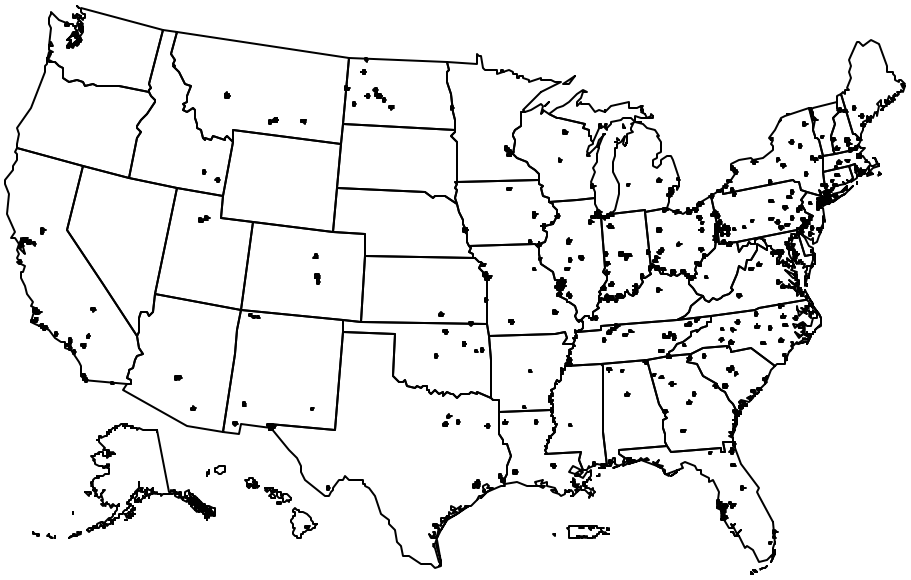


# *'National' Analysis*

# What is the National analysis? - Cont.

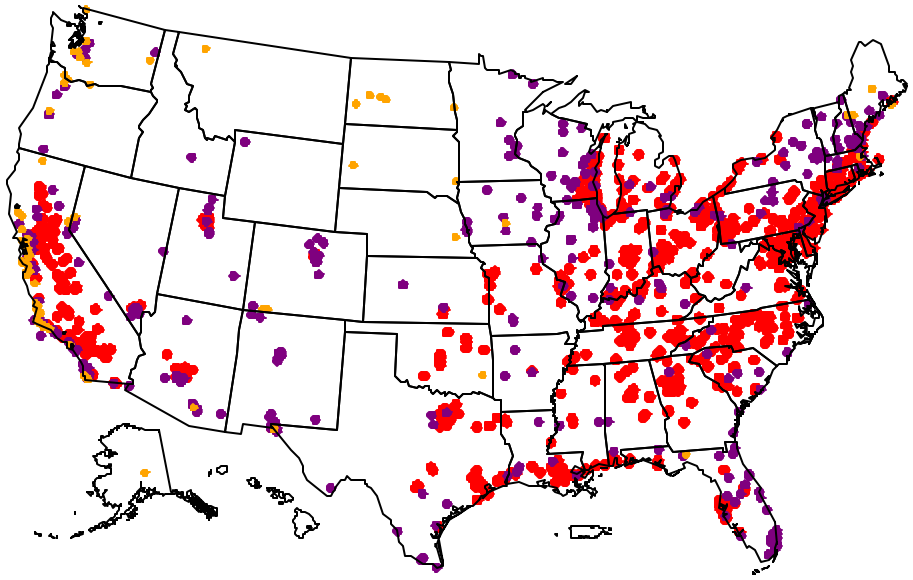
1. Evaluation of each sites' 'percent of NAAQS'

*SO2 Annual Mean*



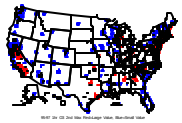
SO2 Annual Mean Percent of NAAQS:Red= >100%. Purple= 80-100%. Orange= 60-80%. Black= <60%

*98-00 8-Hour O3 4th Max*



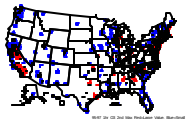
98-00 8-Hour O3 2nd Max Percent of NAAQS:Red= >100%. Purple= 80-100%. Orange= 60-80%. Black= <60%

In general, we have 2 pollutant National problem: $PM_{2.5}$ & Ozone. Other Criteria mainly hot-spot issues.



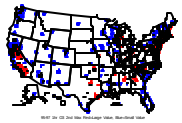
Monitoring Strategy:

# *'National' Analysis*



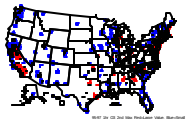
# What is the National analysis?

- Evaluation of all criteria pollutant networks, all metrics (e.g., PM10 annual mean and 24-hr)
- Three central pieces:
  1. Evaluation of each sites' ‘percent of NAAQS’
  2. Multi-objective 'information value’ approach ~ Shows relative value of each site according to different monitoring objectives ~ Ranked each site (by pollutant / metric) according to 5 measures [Concentration, Uncertainty, Deviation from NAAQS, Area represented by Site, & Population represented by site]. The measure rankings were then aggregated based on different weighting schemes and composite maps produced.
  3. Trends evaluation: Looked at 5-year and 10-year trends ('91-'00 & '96-'00)



Monitoring Strategy:

*'National' Analysis*

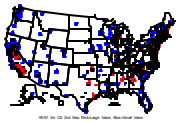


# What is the National analysis? - Cont.

2. Multi-objective 'information value' approach ~ Ranked each site (by pollutant / metric) according to 5 measures: **I) Concentration, II) Uncertainty, III) Deviation from NAAQS, IV) Area represented, and V) Population represented.** The measure rankings were then aggregated based on different weighting schemes and composite maps produced.

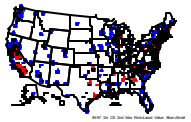
The five different measures represent the information need for (1) population exposure / AQI, (2) compliance monitoring and (3) tracking / model evaluation. The methodology allows easy incorporation of additional measures.

| **AQ Management Activity** | **Geographic Info. Need** |
|---|---|
| Risk assessment | Pollutant concentration |
| Risk Assessment | Persons/Station |
| Compliance evaluation | Conc. vicinity to NAAQS |
| Reg./local source attribution, tracking and model evaluation | Spatial coverage |
| All above | Estimation uncertainty |



Monitoring Strategy:

*'National' Analysis*



# What is the National analysis? - Cont.

2. Multi-objective 'information value' approach ~ Ranked each site (by pollutant / metric) according to 5 measures. Mapped rankings by Quartile.
    I. **Concentration** (ppb, ug/m3...) - the higher the concentration, the more valuable the site for NAAQS usage, exposure, etc.

8-Hour CO 2nd Max: Red=Large Value, Blue=Small Value

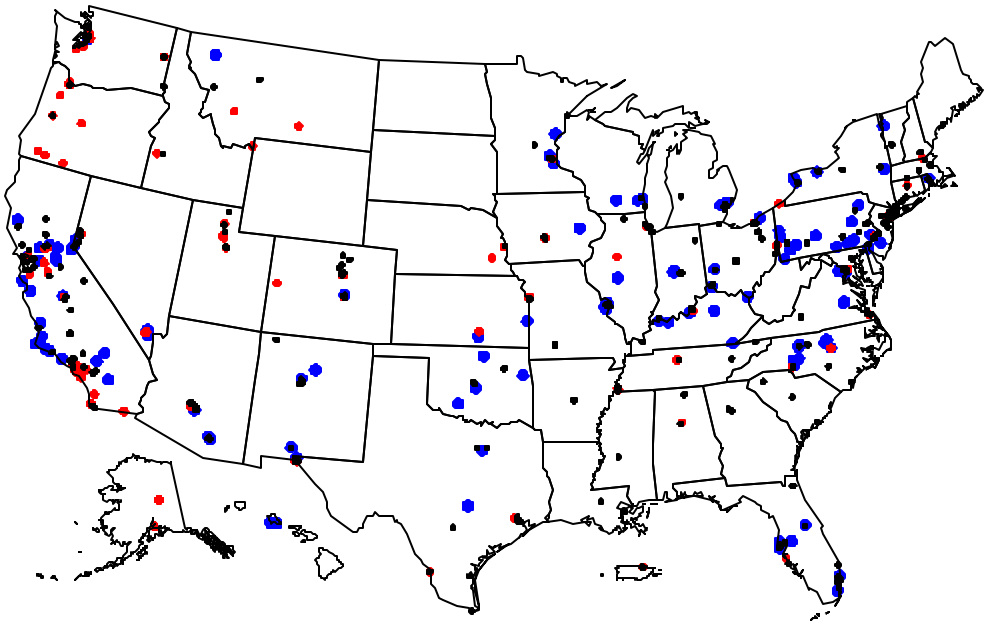
- *The station with the highest concentration is ranked #1.*

Color scheme used on all maps (for all 5 measures):

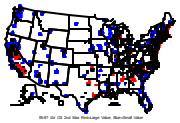
Red = top quartile

Black = middle quartiles

Blue = bottom quartile

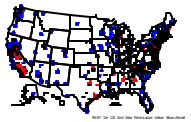


8-Hour CO 2nd Max: Red=Large Value, Blue=Small Value



Monitoring Strategy:

*'National' Analysis*

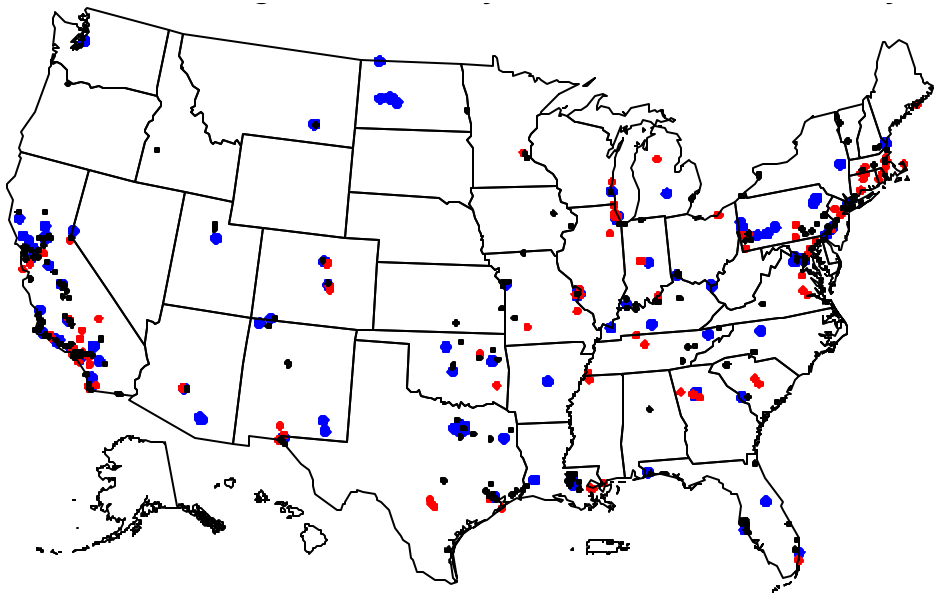


# What is the National analysis? - Cont.

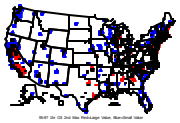
2. Multi-objective 'information value' approach ~ Ranked each site (by pollutant / metric) according to 5 measures.
   II. **Uncertainty** (/estimated-actual/) - the greater the uncertainty in the 'design value', the more valuable the site. If a site wasn't present in a particular location, how well could the concentration metric (for that location) be estimated based on surrounding sites. Measure of 'uniqueness'; don't need redundant sites

- *The station with the highest deviation between the actual and the estimated values (i.e. estimation uncertainty) is ranked #1.*
- *The estimation uncertainty depends on the spatial extrapolation method. The spatial extrapolation method used here is a declustered, inverse distance weighted scheme developed by CAPITA.*

Predicting NO2 Annual Mean:

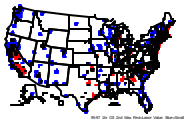


Predicting NO2 Annual Mean: Red=High Uncertainty, Blue=Low Uncertainty



Monitoring Strategy:

*'National' Analysis*

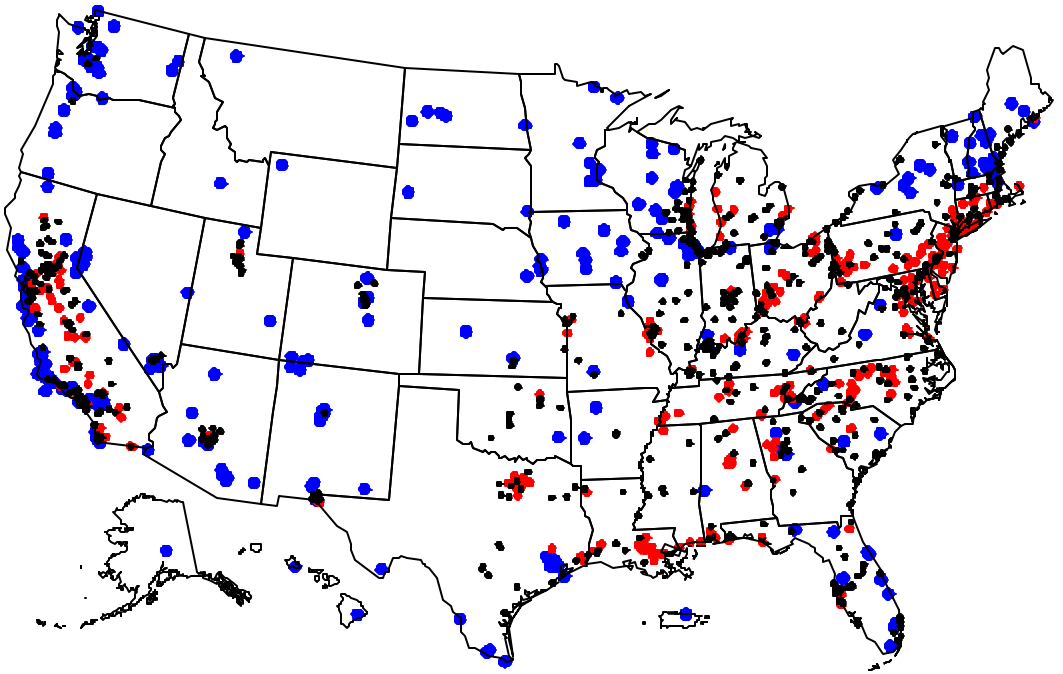


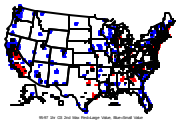
# What is the National analysis? - Cont.

2. Multi-objective 'information value' approach ~ Ranked each site (by pollutant / metric) according to 5 measures.
   III. **Deviation from NAAQS** (/3yr dv - standard/) - the smaller the deviation the higher the rank. If a site is very close to the NAAQS (too close to call based on estimation), the site is probably needed to determine attainment or not.

Deviation from 1-hr O3 2nd Max NAAQS (98-00):

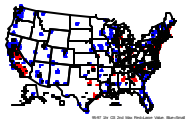
- *Deviation from NAAQS measures the station's value for compliance evaluation.*
- *The station ranking is according to the absolute difference between the station value and the NAAQS.*
- *The station whose concentration is closest to the standard (smallest deviation) is ranked #1.*





Monitoring Strategy:

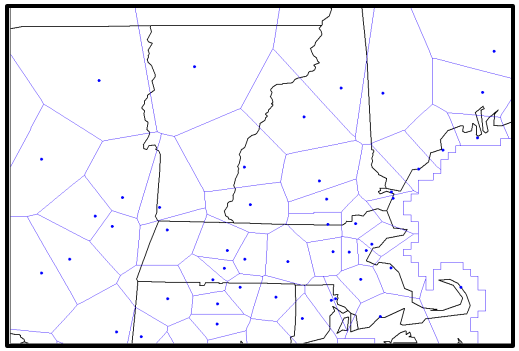
*'National' Analysis*



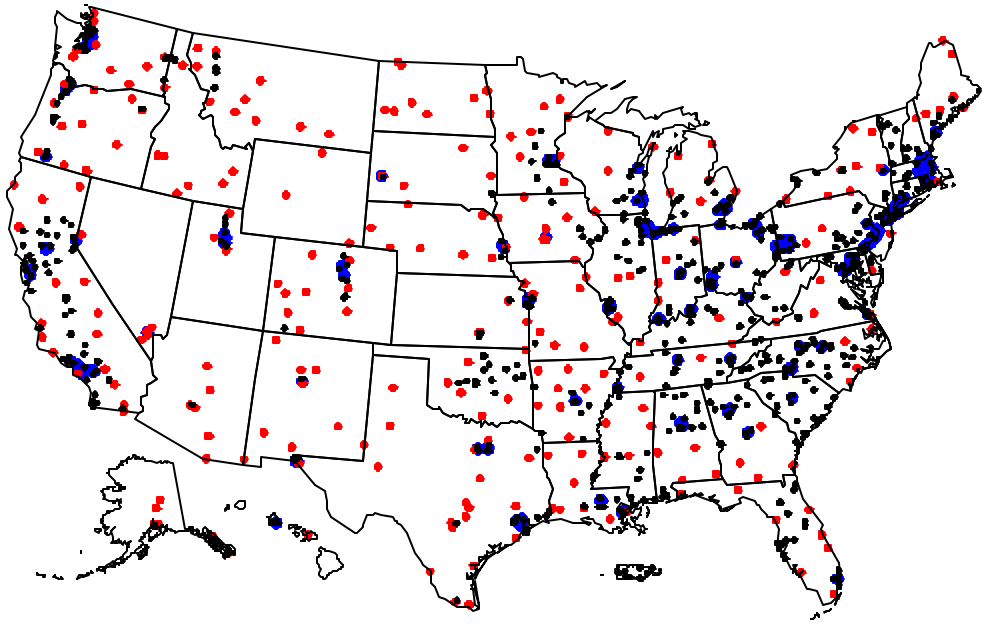
# What is the National analysis? - Cont.

2. Multi-objective 'information value' approach ~ Ranked each site (by pollutant / metric) according to 5 measures.
   IV. **Area of sampling zone** (km2) - measures the geographic surface area each station covers. The highest ranking is for the station with the largest area in it's sampling zone. This measure assigns high relative value to remote regional sites and low value to clustered urban sites with small sampling zones.

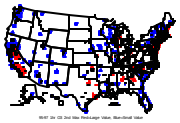
- *Every location on the map is assigned to the **closest monitoring station**.*
- *At the boundaries the distance to two stations is equal.*
- *Following the above rules, the 'sampling zone' surrounding each site is a **polygon**.*
- *The **area** ($km^2$) of each polygon **is calculated.***



Area for PM25 Monitors

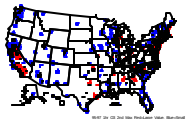


Area for PM25 Monitors: Red=Large Area. Blue=Small Area



Monitoring Strategy:

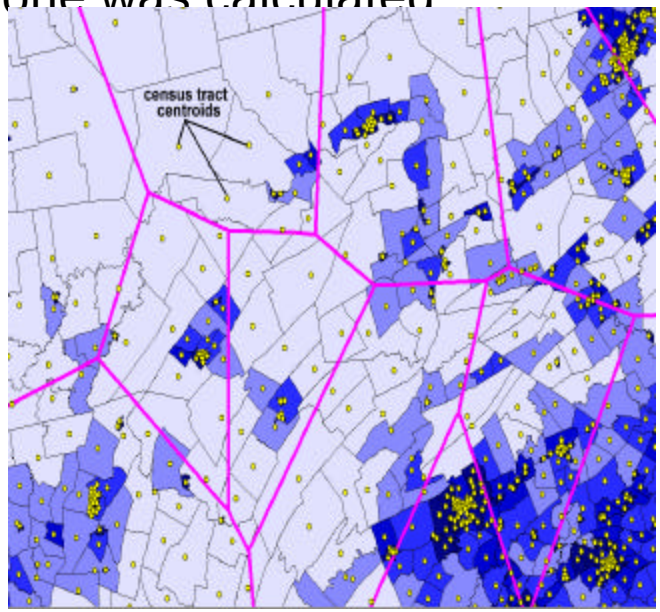
*'National' Analysis*



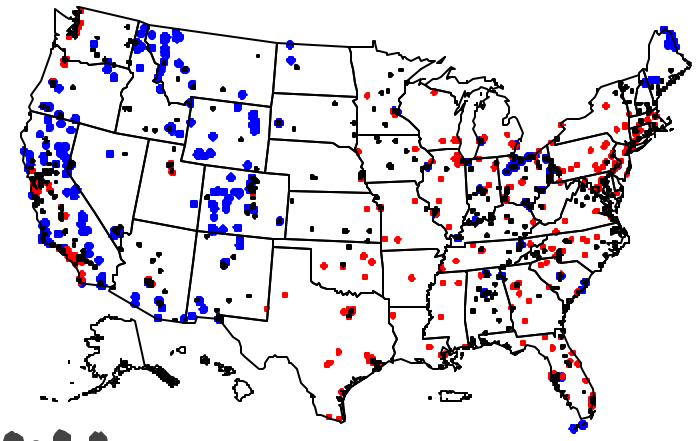
# What is the National analysis? - Cont.

2. Multi-objective 'information value' approach ~ Ranked each site (by pollutant / metric) according to 5 measures.
   V. **Population represented** (persons / station) - the greater the population, the more important the site. The representative population for a monitor is calculated in three steps: 1) Population data (1999) at the census tract were obtained; 2) The population from each census tract was assigned to a specific station's sampling zone; 3) The sum of all census tracts in a station sampling zone was calculated.

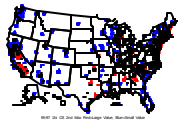
- *The population data used for determining a station's population is from ESRI's census tract file with estimated 1999 populations.*
- *The centroid of each census tract is associated with a station area (polygon).*
- *The census tract populations for all centroids that fall within a station's area are summed.*




Population for PM10 Monitors

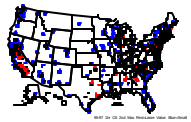


Population for PM10 Monitors: Red=Large Population, Blue=Small Population



Monitoring Strategy:

*'National' Analysis*

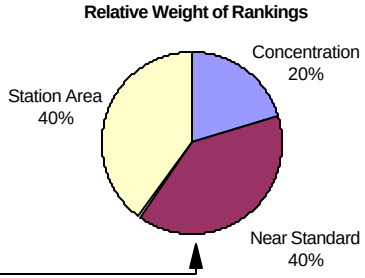


# What is the National analysis? - Cont.

2. Multi-objective 'information value' approach ~ Ranked each site (by pollutant / metric) according to 5 measures. *The measure rankings were then aggregated based on different weighting schemes and composite maps produced.*

*weighting is subjective!*

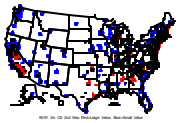
| | Concentration | Uncertainty | Deviation from NAAQS | Area | Population |
|---|---|---|---|---|---|
| W1: equal weights | 20% | 20% | 20% | 20% | 20% |
| W2: NAAQS Compliance | 30% | 30% | 5% | 5% | 5% |
| W3: Exposure / AQI | 30% | 5% | 5% | 30% | 30% |
| W4: ? | 50% | 50% | 0 | 0 | 0 |
| W5: Emissions tracking/model evaluation | 20% | 40% | 0 | 40% | 0 |




*Pie charts on aggregate maps show weighting schemes*

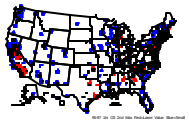
*How the measures are weighted affects the final ranking!*

- What is the main objective of the network / site?
- Is it meeting that objective?



Monitoring Strategy:

*'National' Analysis*

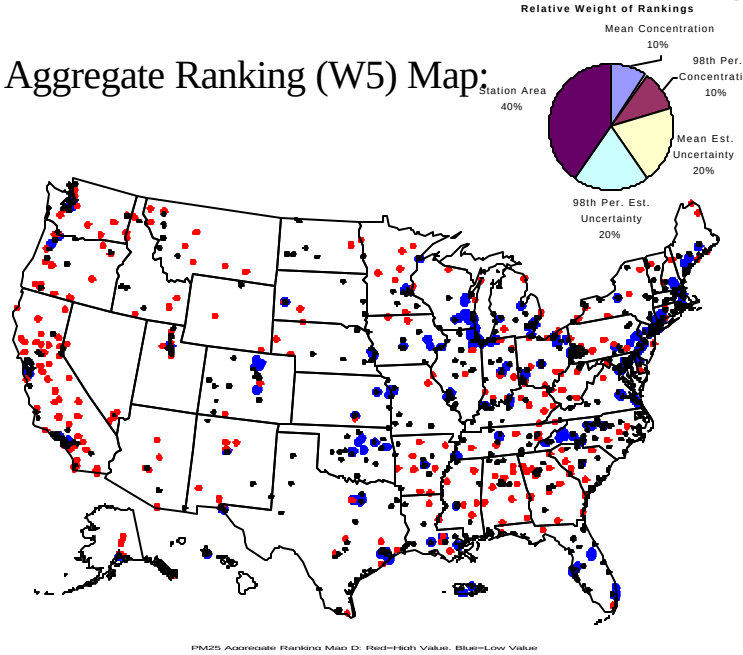


# What is the National analysis? - Cont.

2. Multi-objective 'information value' approach ~ Ranked each site (by pollutant / metric) according to 5 measures. *The measure rankings were then aggregated based on different weighting schemes and composite maps produced.*

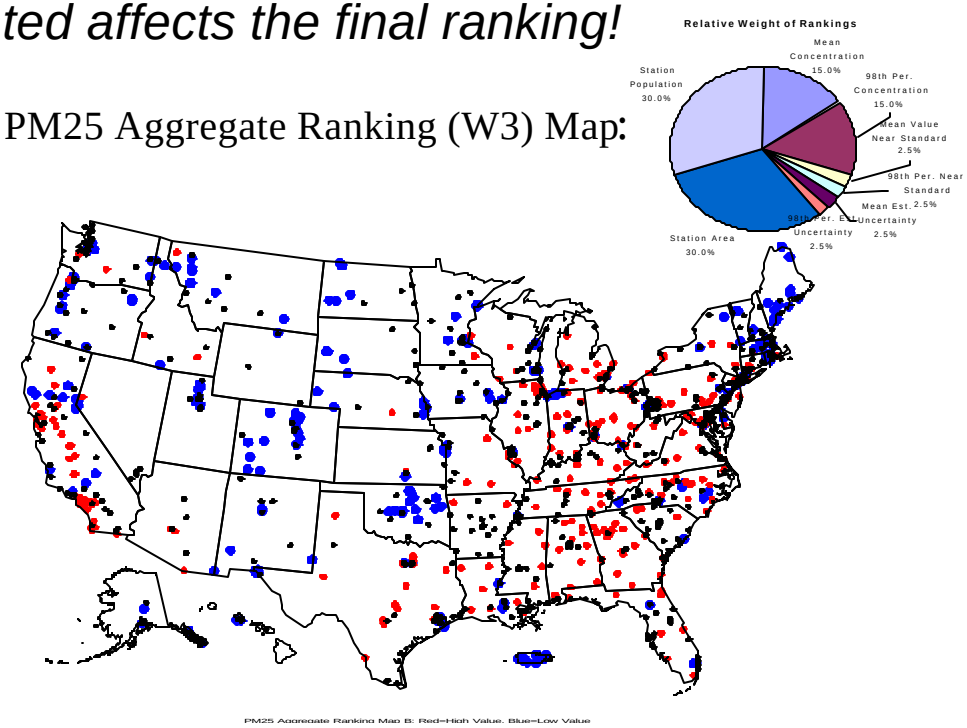
*How the measures are weighted affects the final ranking!*

PM25 Aggregate Ranking (W5) Map:

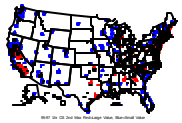



Emissions tracking/model evaluation

PM25 Aggregate Ranking (W3) Map:

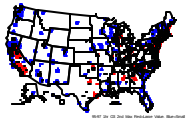



Exposure / AQI



Monitoring Strategy:

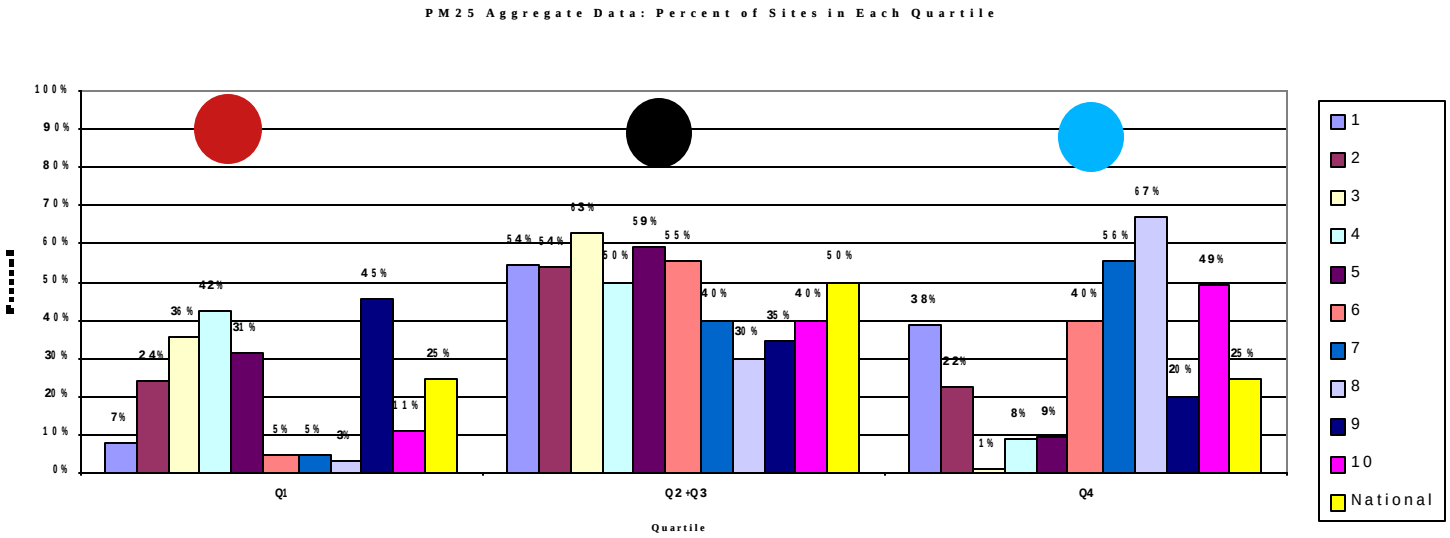
# *'National' Analysis*



# What is the National analysis? - Cont.

2. Multi-objective 'information value' approach ~ Ranked each site (by pollutant / metric) according to 5 measures. The measure rankings were then aggregated based on different weighting schemes and composite maps produced. *Related outputs for each measure and/or aggregate were also produced*

***1. Breakdown of National Quartiles by Region***

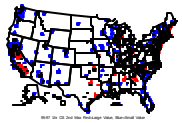



- Regions 4 and 9 appear to have proportionally more 'important' (red) sites than the National average.
- Region 8 appears to have proportionally more 'least important' (blue sites than the National average

***2. Table of Quartile cutoffs (in measure units)***

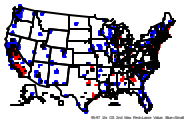
| | PM25 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | pm25mean | % of NAAQS | 98th percentile | % of NAAQS | pm25error | 98th per. error | dif_NAAQS_mean | dif_NAAQS_98 | area | population |
| **Q1** | 15.5 | 103.3% | 38 | 58.5% | 1.75445 | 5.8182 | 1.2 | 28 | 9301 | 322779 |
| **Q3** | 10.4 | 69.3% | 27 | 41.5% | 0.4174 | 1.2032 | 4.95 | 38 | 1188 | 109192 |

- Relates actual (absolute) values to the relative measure breaks.
- For example, 25% of PM2.5 sites have a 2-yr annual mean >= 15.5. 25% of the sites have an error (uncertainty) < .42 ug/m3



Monitoring Strategy:

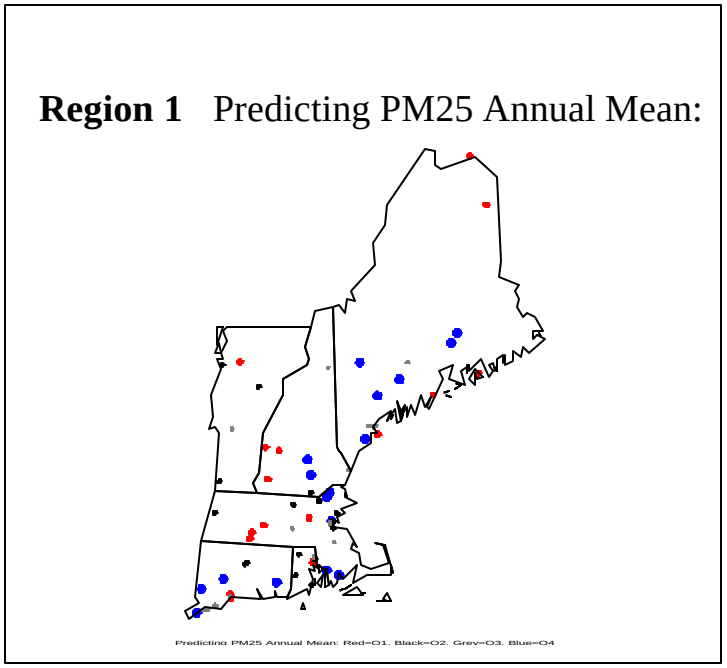
# *'National' Analysis*

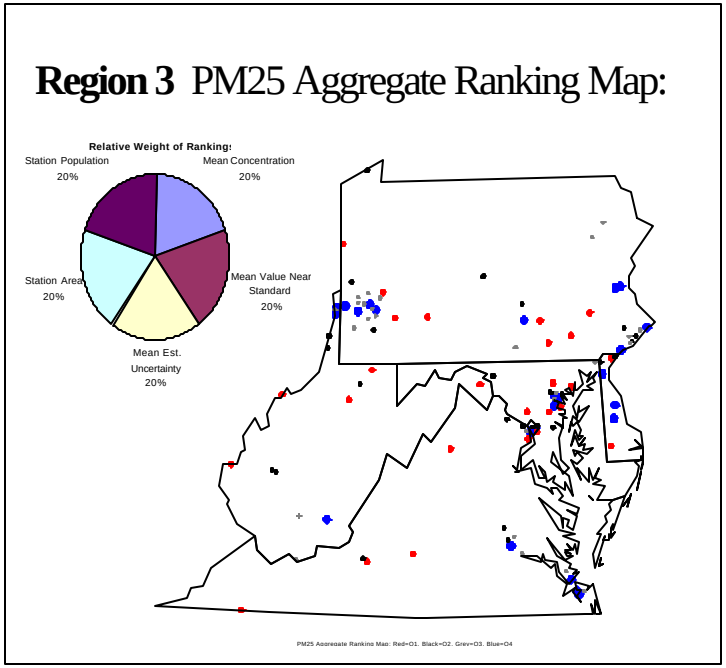


# What is the National analysis? - Cont.

2. Multi-objective 'information value' approach ~ Ranked each site (by pollutant / metric) according to 5 measures. The measure rankings were then 'aggregated' based on different weighting schemes and 'composite' maps produced. *Related outputs for each measure and/or aggregate were also produced*

***3. Regional maps for O3 and PM2.5 ~ Quartiles are assigned by Region.***



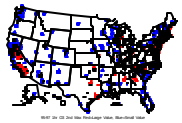




- Shows each sites' relative ranking quartile in the Region (versus its National quartile) Could be red in National but blue in Region (or vice versa)

***4. Spreadsheets showing each sites' measure values, National ranking, and National quartile.***

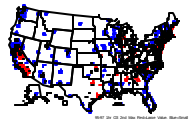
| Sitecode | Mean | rank_mean | q_mean | no2err | rank_no2err | q_no3err | dif_NAAQS | rank_dif_NAAQS | q_dif_NAAQS | Area | rank_area | q_area | Population | rank_population | q_population |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 011170004 | 0.010 | 297 | 3 | 0.0024 | 272 | 3 | 0.043 | 297 | 3 | 82560 | 29 | 1 | 2768327 | 6 | 1 |
| 040130019 | 0.029 | 28 | 1 | 0.0071 | 88 | 1 | 0.024 | 28 | 1 | 85622 | 27 | 1 | 1271983 | 57 | 1 |

- Can be used to rerank by Region, State, MSA, etc.



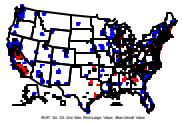
Monitoring Strategy:

# *'National' Analysis*



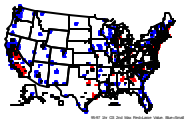
# What is the National analysis?

- Evaluation of all criteria pollutant networks, all metrics (e.g., PM10 annual mean and 24-hr)
- Three central pieces:
  1. Evaluation of each sites' ‘percent of NAAQS’
  2. Multi-objective 'information value’ approach ~ Shows relative value of each site according to different monitoring objectives ~ Ranked each site (by pollutant / metric) according to 5 measures [Concentration, Uncertainty, Deviation from NAAQS, Area represented by Site, & Population represented by site]. The measure rankings were then aggregated based on different weighting schemes and composite maps produced.
  3. Trends evaluation: Looked at 5-year and 10-year trends ('91-'00 & '96-'00)



Monitoring Strategy:

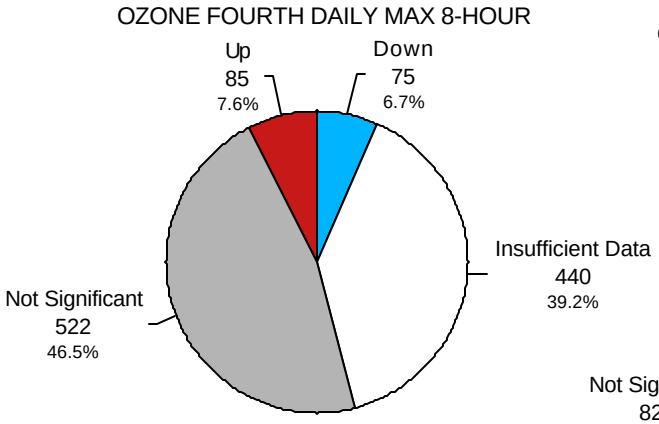
*'National' Analysis*



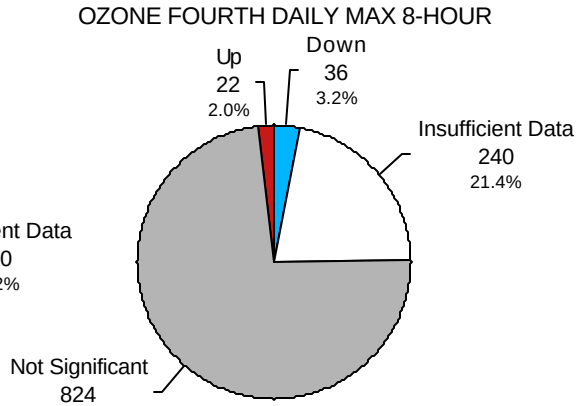
# What is the National analysis? - Cont.

3. Trends evaluation: Looked at 5-year and 10-year trends
   - Identified and summarized site trends
     - Used same non-parametric trend routine utilized in Trends Report

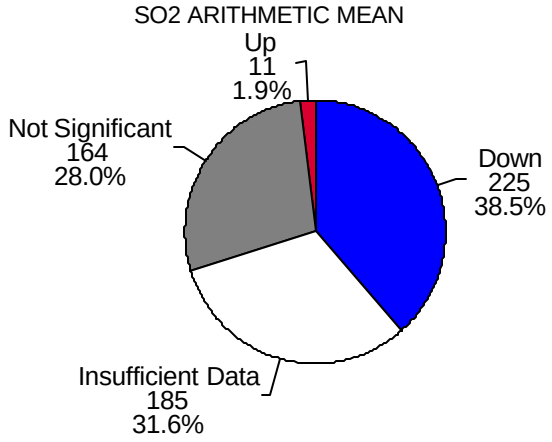
## O3 10-Year Trend

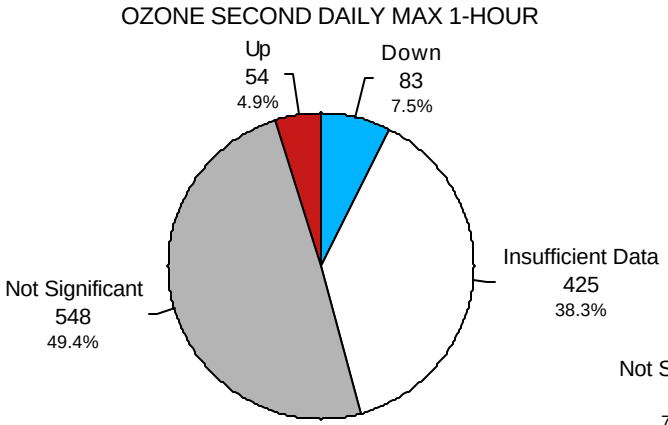


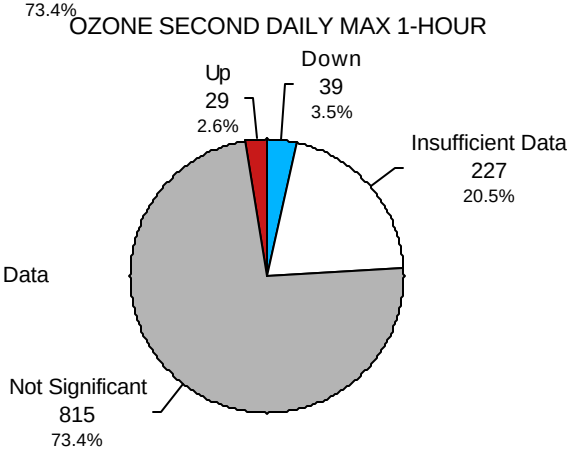

## O3 5-Year Trend

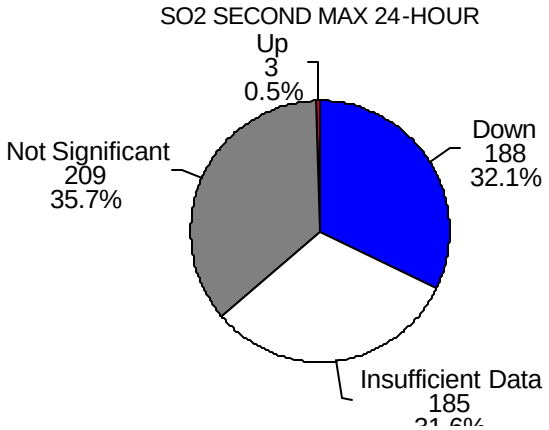


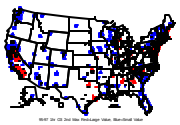

## SO2 10-Year Trend



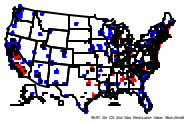





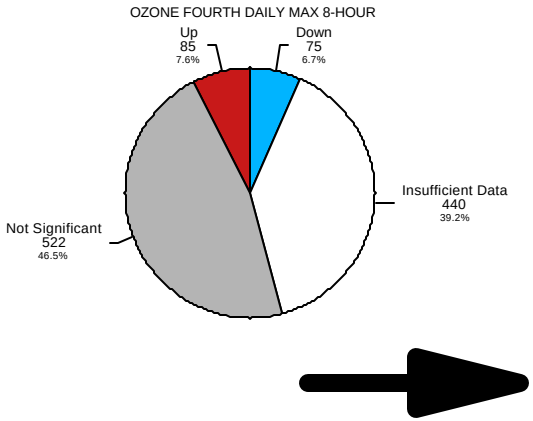
Monitoring Strategy:

# *'National' Analysis*

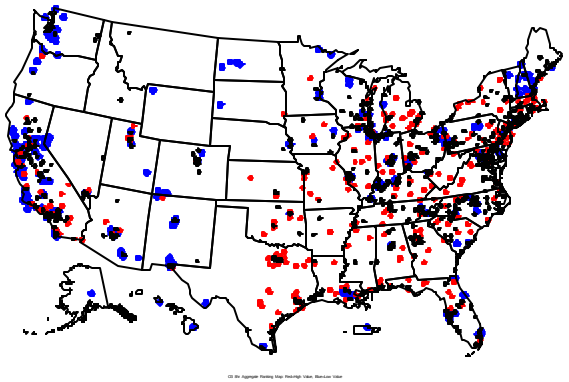


# What is the National analysis? - Cont.

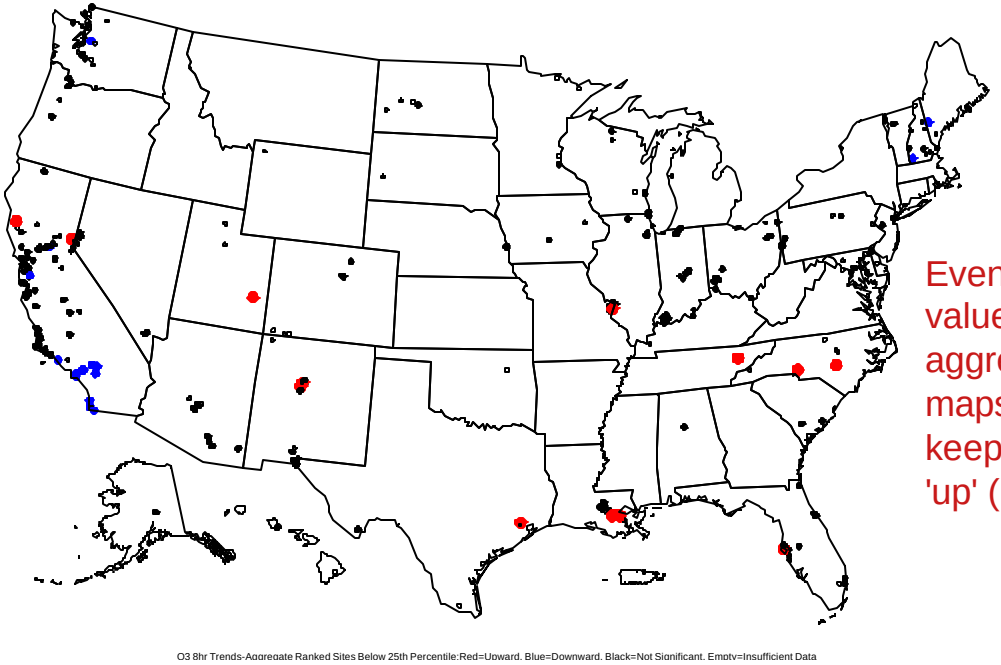
3. Trends evaluation: Looked at 5-year and 10-year trends
   - Merged Trend information with 'information value' (#2) analysis



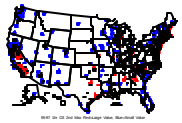

8-Hour O3 Aggregate Ranking Map:
Red=High Value, Blue=Low Value



8-hr O3 10-yr Trends - Aggregate Ranked (Equal Weighting) Sites in 4th Quartile (Least Important):
Red=Up, Blue=Down, Black=Not Significant ← Not quartiles!

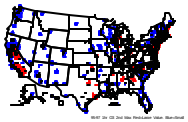



Even if a site is 'low value' (blue) in aggregate measure maps, you may want to keep if its data trend is 'up' (red on this map)



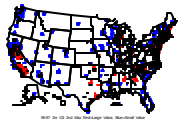
# Monitoring Strategy:

# *'National' Analysis*



# Who? When? Where?

- Who did the analyses:
  - Rudy Husar / Stefan Falke of CAPITA (Center for Air Pollution Impact and Trend Analysis) developed base concept and ozone prototype; and ran uncertainty (spatial interpolation), calculated the areas (zones of influence), and corresponding populations.
  - AQTAG & MQAG created input data files; ran other measures, percent of NAAQS, and trends; and made maps
  - National Monitoring Strategy Committee (Scheffe, Koerber, etc.) provided guidance (e.g, what years to use), developed weighting schemes.....
- When was the analyses done?
  - Prototype delivered December '00; final analyses July '01
- **Where can you find the analyses?**
  - AMTIC > National Air Monitoring Strategy Information > Network Assessments and Maps **http://www.epa.gov/ttn/amtic/netamap.html**
    - Outputs from the National Network Assessment Introduction and Explanation-File #1
    - Outputs from the National Network Assessment Results-File #2
    - Outputs from the National Network Assessment Results-File #3
    - Outputs from the National Network Assessment Results (ozone regional maps) -File #4
    - Outputs from the National Network Assessment Results (PM2.5 regional maps)-File #5
    - Inputs to the National Network Assessment Pollutant site files in Excel format



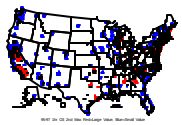
Monitoring Strategy:

# *'National' Analysis*

What does the National analysis show? (General Interpretations)

- **"Clearly, two criteria pollutants, ozone and PM2.5, dominate the nation's air quality with respect to elevated concentrations."**

- **"These results reinforce our general understanding of the surplus of monitoring sites for criteria pollutants for which substantial progress has been achieved in reducing concentrations of CO, SO2, NO2, Pb and PM10 over the last 20 years. "**



# Monitoring Strategy:

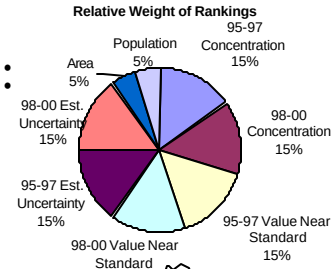
# *'National' Analysis*

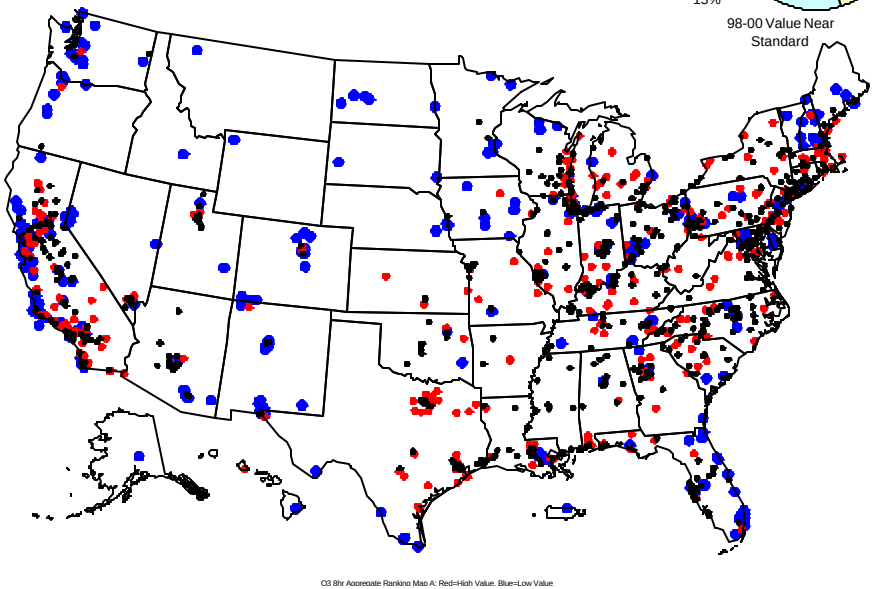
What does the National analysis show? (General Interpretations)

## Ozone

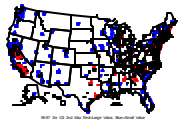
- Limited reductions nationally (5 - 30%)
- Reductions mainly from dense urban clusters
  - Examples include Chicago, major Eastern cities (New York, Boston, Philadelphia, Pittsburgh, Baltimore-D.C) and major California cities
- Emphasis on relocation to areas of high uncertainty (to enhance mapping, characterize rural/regional concentrations, etc.)
  - Possible increases to assist in coverage in southeast and Texas

8-Hour O3 Aggregate Ranking Map:
Red=High Value, Blue=Low Value



O3 8hr Aggregate Ranking Map A: Red=High Value, Blue=Low Value



# Monitoring Strategy:

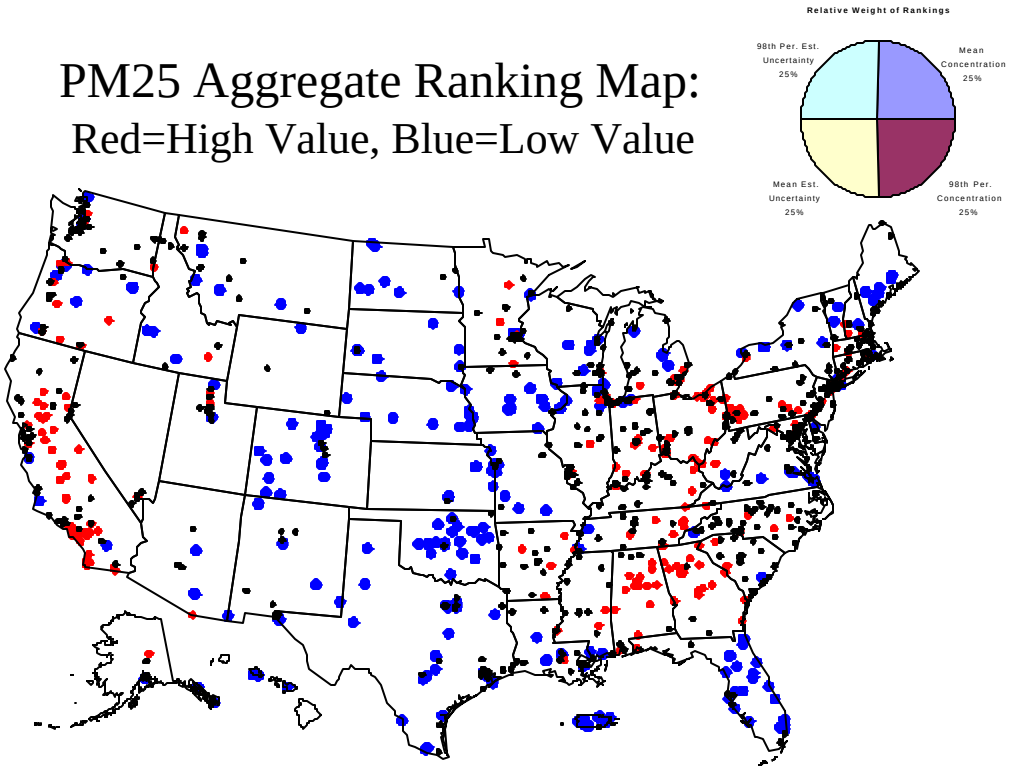
# *'National' Analysis*

## What does the National analysis show? (General Interpretations) - cont.

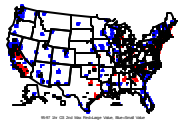
## PM2.5

- Moderate reductions (20-30% to ~ 800 sites) after 3 years data collected
  - Coinciding with a shift to continuous methods for AQI/mapping; eventual 500 site (or smaller) network following successful demonstration of continuous methods
- Reductions probable in several areas of the country including New England, upstate New York, Florida and much of the north central states and west outside California
  - Switch emphasis to characterizing background, gradient patterns, and public reporting more than NAAQS compliance.

PM25 Aggregate Ranking Map:
Red=High Value, Blue=Low Value




PM25 Aggregate Ranking Map C: Red=High Value, Blue=Low Value



# Monitoring Strategy:

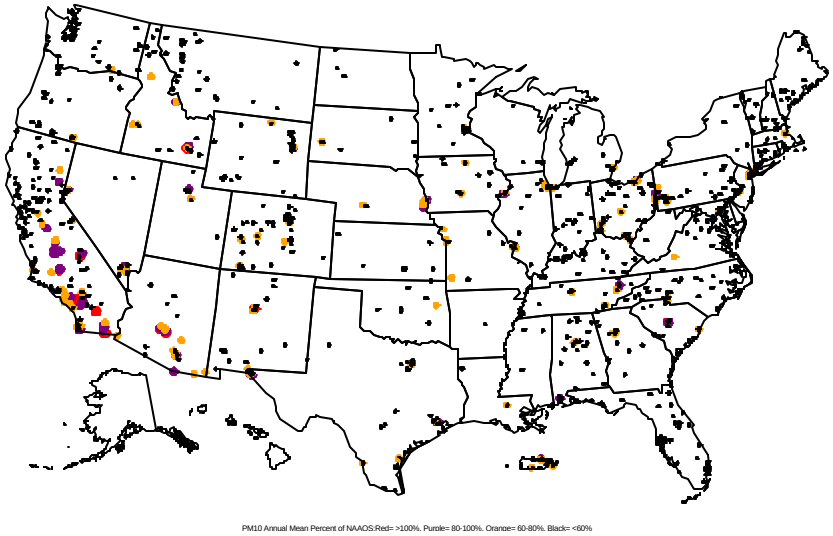
# *'National' Analysis*

## What does the National analysis show? (General Interpretations) - cont.

## PM10

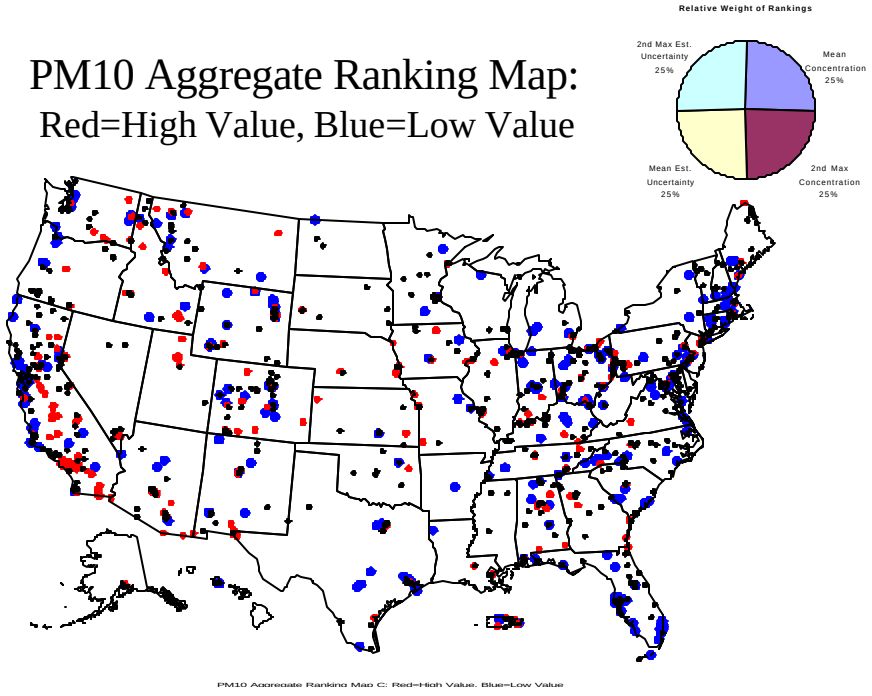
- A major reduction (50-80%) in the number of PM10 monitors is recommended.
  - Only sites that have current exceedances, those required as part of a SIP, and ones important for trends should remain as priority sites.
  - Keep monitors compatible with PM-coarse measurement technology - collocate with PM2.5
- Opportunities for reduction are far greater in Eastern Regions of the country.

PM10 Annual Mean - Percent of NAAQS:
Red= >100%, Purple= 80-100%,
Orange= 60-80%, Black= <60%

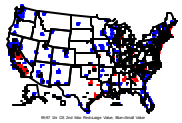


PM10 Annual Mean Percent of NAAQS:Red= >100%. Purple= 80-100%. Orange= 60-80%. Black= <60%

PM10 Aggregate Ranking Map:
Red=High Value, Blue=Low Value




PM10 Aggregate Ranking Map C: Red=High Value, Blue=Low Value



# Monitoring Strategy:

# *'National' Analysis*

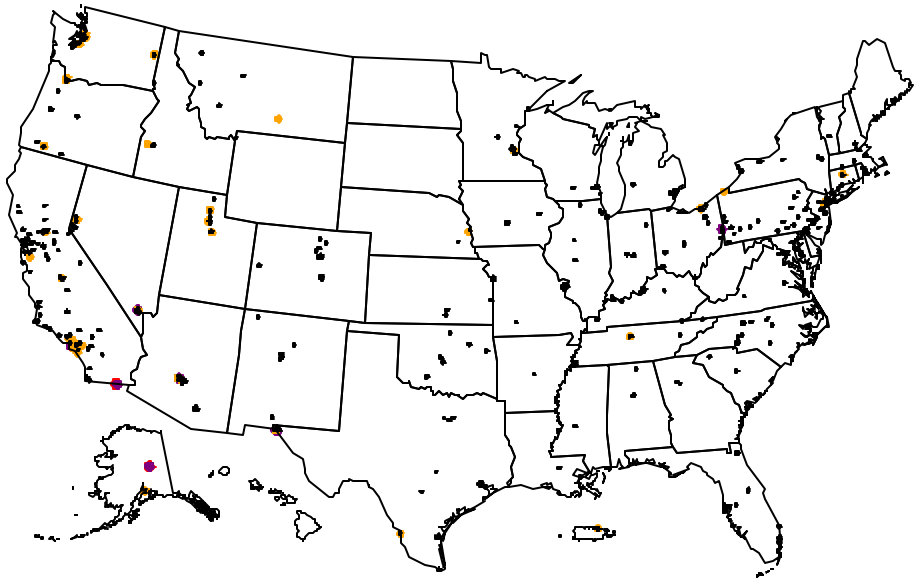
## What does the National analysis show? (General Interpretations) - cont.

## CO

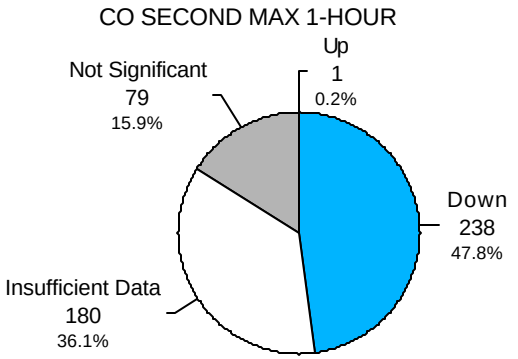
- A major reduction (approximately 50- 80%) in the number of CO monitors is recommended.
  - Only sites that have current exceedances, those required as part of a SIP, and ones important for trends should remain as priority sites.
- Existing CO monitors located in urban microscale sites should be relocated to more broadly representative urban locations.
  - CO monitoring should be conducted using high resolution instruments

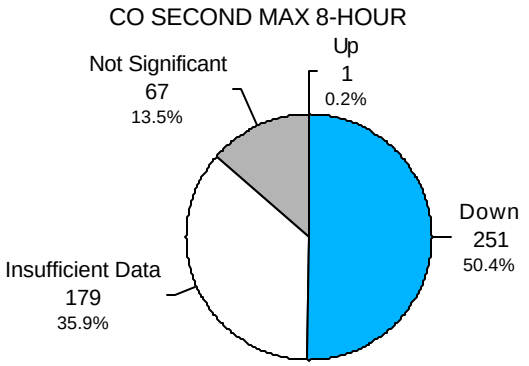
8-Hour CO 2nd Max - Percent of NAAQS:

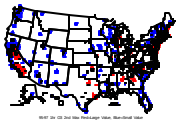
Red= >100%, Purple= 80-100%,
Orange= 60-80%, Black= <60%



CO 10-Year Trend





# Monitoring Strategy:

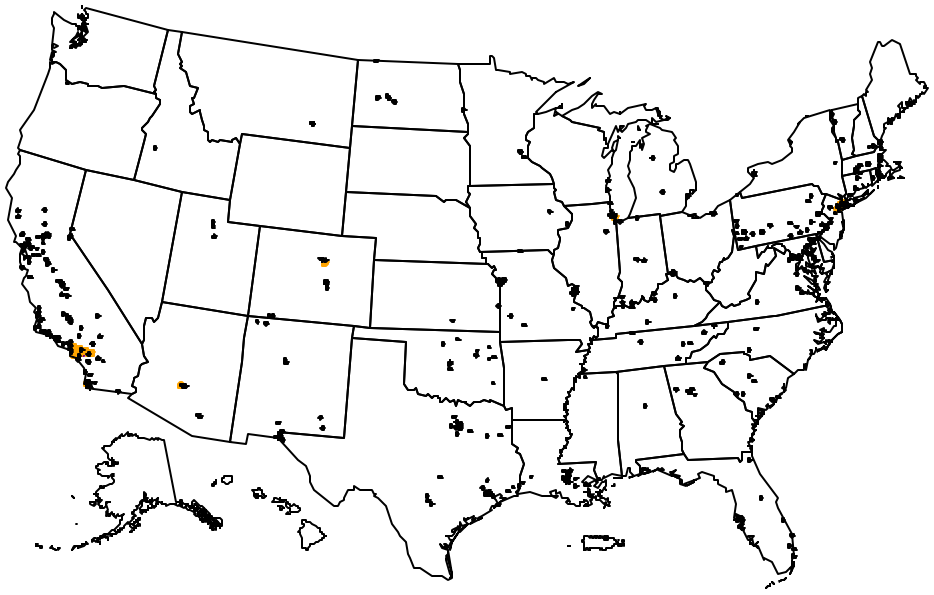
# *'National' Analysis*

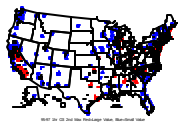
## What does the National analysis show? (General Interpretations) - cont.

## $NO_2$

- The current NO2 network should be reduced approximately 90%
  - Keep only those sites identified by EPA as critical for national trends and those sites identified as supporting model evaluation and emissions tracking needs.
- This divestment should be complemented by investing in high resolution NOy/NO sites placed in regionally representative areas for model evaluation and tracking of emission reduction programs"

NO2 Annual Mean - Percent of NAAQS:
Red= >100%, Purple= 80-100%,
Orange= 60-80%, Black= <60%





# Monitoring Strategy:

# *'National' Analysis*

## What does the National analysis show? (General Interpretations) - cont.

## $SO_2$

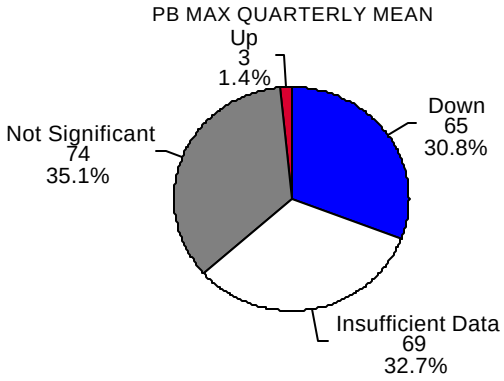
- The network in its current form should be reduced substantially (approximately 50-80%) nationwide.
  - Important compliance sites should be retained
  - A small select number of sites are being adjusted to address 5 minute averaging times in response to concerns regarding short term SO2 exposures.
- Investments in SO2 should be made in monitors capable of reading background concentrations and siting in areas with larger spatial scale representativeness
  - Emphasis as precursor for PM2.5. More focus on evaluation of air quality models and support of OBM's

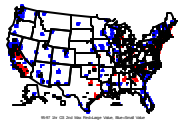
SO2 Annual Mean - Percent of NAAQS:
Red= >100%, Purple= 80-100%,
Orange= 60-80%, Black= <60%


## Pb

- Progress in the reduction of Lead concentrations is a clear air program success story.
  - Limit monitoring to those isolated areas influenced by significant stationary sources
  - Maintain those sites identified by EPA to be retained for long term trends.

10-Year Pb Trend

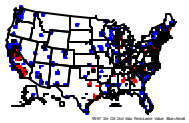




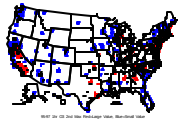
# Monitoring Strategy:

# *'National' Analysis*

## Caveats / Criticisms



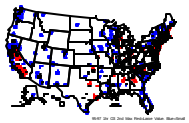
- Regional/local assessments required for site specific recommendations
  - They “overrule” national results
- Too much focus on Relative importance, not enough on Absolute value
- Limited applicability due to national scale, e.g.:
  - Rationale in comparing NE O3 with NW O3?
  - uneven site spatial scales compromise error and spatial assumptions for CO and PM10
- Too much emphasis on high concentrations
  - Compromise value of background, gradient sites for model evaluation and other needs
- Subjectivity in weighting measures
- Absence of policy realities
- Recommendations still are not supported firmly by quantitative results



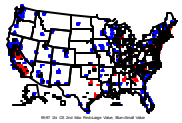
# Monitoring Strategy:

# *'National' Analysis*

## Caveats / Criticisms

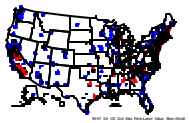


- Years used: The 'percent of NAAQS' and 'info value' analyses should not have been limited to only 1998-2000 (&1995-1997 O3)
- Real design values should have been used (exceedance vs concentration, actual vs estimated, 2yr for CO, etc.)
- The 'uncertainty' methodology is too simplistic
- A daily 'uncertainty' measure (to account for AQI, etc.) should also have been included
- A 'NAAQS designation' factor (e.g. number of sites in county) should have been included
- The 'sampling zone' polygons are meaningless. Something else (e.g., distance to nearest site) should have been used instead
- Non-FRM monitors were accidentally included for Pb
- Incomplete data were used for some sites
- The pollutant by pollutant analyses is not applicable to sites that monitor multiple criteria pollutants ~ a collocation factor should have been included



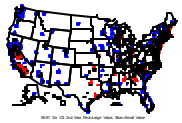
# Monitoring Strategy:

# *'National' Analysis*



## Follow-up activities

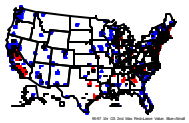
- "All EPA regional offices, in conjunction with the states, tribes, and any multi-state organizations in that region, should undertake a regional/local assessment to complement this national assessment. **These regional/local assessments should be delivered to OAQPS by 10/02** and should include an interpretation of this national assessment as it affects their region, and proposed regional network modifications that are either consistent with this assessment or reflect more refined assessments conducted for their region."
  - Guidance needed
- Portable network design software (Design Interface) ~ a tool for Regions/States/Tribes
  - Current development focus:  Applicability to NAAQS, functionality, stability
- Spatial Data Analysis Technical Exchange Workshop & ORD Cooperative Agreement (w/ Duke, NCSU stat professors)
  - Technique development and transfer
- Various EMAD analysis



Monitoring Strategy:

# *'National' Analysis*

## Relevance to Spatial Workshop



- **Spatial analyses methods / tools needed for:**
  - **Network design (subsets, initial setups, relocations)**
  - **Determination of monitoring scales ('sampling zones')**
- **For Regional / local assessments, techniques need to be Relevant and Repeatable**
- **Although National Analyses may have very limited 'sound science' basis,**
  - **It addresses multiple objectives of networks**
  - **It's easy to understand**